

CLAIMS

1. Door (8) designed to be inserted between a cockpit (4) and a cabin (6) of an aircraft, said door (8) having a cockpit side (8a) and a cabin side (8b), characterised in that it comprises at least one trapdoor (22) capable of firstly closing off a passageway (20) provided through said door (8) and secondly of opening towards the cabin side (8b) of this door, the door (8) also comprising a mechanism (30) for locking / unlocking of the trapdoor (22) arranged on the cockpit side (8a) of the door (8) and capable of automatically unlocking the trapdoor (22) when the difference between a cockpit pressure corresponding to the air pressure applied against the cockpit side (8a) of said door (8) and a cabin pressure corresponding to the air pressure applied against the cabin side (8b) of said door (8), is greater than a predetermined value.

2. Door (8) according to claim 1, characterised in that said predetermined value of the air pressure difference is such that it can generate a sufficient force on the trapdoor (22) to cause automatic opening of the unlocked trapdoor (22) towards the cabin side (8b) of said door (8).

3. Door (8) according to claim 1 or claim 2, characterised in that the locking / unlocking mechanism (30) is mounted on the trapdoor (22) of the door (8).

4. Door (8) according to claim 3, characterised in that the locking / unlocking mechanism (30) comprises:

- a secondary trapdoor (34) comprising a first surface (34a) and a second surface (34b), the first surface (34a) being subject to the cockpit pressure,

- a membrane (42) defining a chamber and being provided with a first end (42a) and a second end (42b), the first end (42a) being fixed to the second surface (34b) of the secondary trapdoor (34), and the second end (42b) being fixed to a portion (44) of the trapdoor (22) provided with at least one through orifice (46), such that at least a part of the second surface (34b) of the secondary trapdoor (34) is subjected to cabin pressure, and

- means of transmission of movement connected firstly to the secondary trapdoor (34) that can be moved when the cockpit pressure and the cabin pressure are different, and secondly to at least one bolt (54) that will cooperate with a trapdoor frame (24) provided on the door (8) and defining said passageway (20).

5. Door (8) according to claim 4, characterised in that the secondary trapdoor (34) comprises an upper end (52) and a lower end (38), the lower end (38) being connected hinged onto the trapdoor (22) and the upper end (52) being connected hinged to the movement transmission means.

6. Door (8) according to claim 5, characterised in that the movement transmission means for each bolt (54) in the locking / unlocking mechanism (30) includes:

- a connecting rod (56), provided with a first end (56a) and a second end (56b), the first end (56a) being connected hinged to the upper end (52) of the secondary trapdoor (22), and

- a sliding transmission rod (58) provided with a first end (58a) and a second end (58b), the first end (58a) being connected hinged to the second end (56b) of said connecting rod (56), and the second end (58b) being connected fixed to said bolt (54).

7. Door (8) according to claim 6, characterised in that for each bolt (54) in the locking / unlocking mechanism (30), the movement transmission means also comprise a guide bushing (60) fixed to the trapdoor (22) in said door (8), and inside which the transmission rod (58) is free to slide.

8. Door (8) according to claim 7, characterised in that each bolt (54) in the locking / unlocking mechanism (30) is fixed to a lever (64) that can be actuated in order to release said trapdoor (22) manually, a return spring (66) of the bolt (54) being arranged between said lever (64) and the guide bushing (60) of the movement transmission means.

9. Door (8) according to any one of claims 4 to 8, characterised in that the movement transmission means for each bolt (54) in the locking / unlocking mechanism (30) also include anti-acceleration means (74) designed to stop the movement of the transmission rod (58) when

the transmission rod is moving at a speed greater than a predetermined speed.

10. Door (8) according to any one of claims 4 to 8, characterised in that for each bolt (54) in the locking / unlocking mechanism (30), the movement transmission means also comprise stop means (90) provided with an inertial mass (92) that can move automatically from a withdrawn position to a stop position, following a shock that occurs on the door (8) with an intensity greater than or equal to a predetermined intensity, so as to form a stop for a stop device (98) fixed to said bolt (54).

11. Door (8) according to any one of claims 4 to 10, characterised in that the locking / unlocking mechanism (30) also includes a balancing system (84) for the secondary trapdoor (34), said balancing system (84) being designed to prevent any movement of the secondary trapdoor (34) that could cause unlocking of this trapdoor (22) following a shock applied on said door (8).

12. Door (8) according to any one of claims 4 to 11, characterised in that the locking / unlocking mechanism (30) is protected by a protection cover (32) installed on the cockpit side (8a) on the trapdoor (22) in said door (8).

13. Door (8) according to any one of claims 4 to 12, characterised in that said the portion (44) of the

trapdoor (22) provided with at least one through orifice (46) is covered by a filter (68) arranged on the cabin side (8b) of said door (8) and concealing the location of each orifice (46), said filter (68) being held in contact with the trapdoor (22) by a bullet-proof protection grill (70) assembled on said trapdoor (22).

14. Door (8) according to claim 13, characterised in that the bullet-proof protection grill (70) is assembled on the trapdoor (22) using a plurality of studs (72) passing through said trapdoor (22), and that can only be disassembled from the cockpit side (8a) of said door (8).

15. Door (8) according to any one of the previous claims, characterised in that the trapdoor (22) comprises a lower part (28) provided with pivot hooks (26) designed firstly to hold the trapdoor (22) in a passageway (20) closing position when it locked, and secondly to enable pivoting of said trapdoor (22) towards the cabin side (8b) when it is unlocked.

16. Door (8) according to any one of the previous claims, characterised in that the trapdoor (22) comprises an upper part (63) provided with means (62) of retaining said trapdoor (22) in the passageway (20).

17. Door (8) according to claims 4 and 16 combined, characterised in that the retaining means (62) are composed of at least one ball pusher capable

of cooperating with the trapdoor frame (24) fixed in said door (8).

18. Door (8) according to any one of the previous claims, characterised in that it comprises a main door body (18) and the trapdoor (22) that can be mounted on the main door body (18) in order to close off said passageway (20), the trapdoor (22) fitted with the locking / unlocking mechanism (30) being fully removable from the main door body (18).

19. Door (8) according to claim 18, characterised in that the main door body (18) and the trapdoor (22) are made from a bullet-proof material.

20. Door (8) according to any one of the previous claims, characterised in that the passageway (20) is sufficiently large to enable evacuation of personnel through said passageway (20).

21. Door system (2) designed to be inserted between a cockpit (4) and a cabin (6) of an aircraft, said system (2) comprising a doorframe (12) and a door (8) with a cockpit side (8a) and a cabin side (8b), the doorframe (12) being capable of partially covering the cabin side (8b) of said door (8) and preventing this door from being opened in any direction except towards the cockpit side (8a), characterised in that said door (8) is a door according to any one of the previous claims.